Agenda
Modeling team meeting
April 24, 1997
0900-11:00
Run 1142

- DWRSIM modeling activities: model development, sensitivity runs, production runs, proposed activites
- DWRDSM modeling activities: same
- DWRDSM1 recalibration progress report
- Spreadsheet Post-Processing

D-006090

TEST DWRSIM STUDY RESULTS FOR CALFED ENVIRONMENTAL & WATER SUPPLY BENEFITS

Study Information			Test	Delta Outflow (TAF/yr) [1]		Delta Exports (TAF/yr) [1]						SWP Deliveries (TAF/yr) [1]			
						SWP		CVP		Total [2]		Entitlement		Interruptible	
Base	Ver	Date	Description	critical	73-yr	critical	73-yr	critical	73-yr	critical	73-yr	critical	73-yr	critical	73-yr
----	8.41	3/6/97	Study 495	-130	-610	500	560	20	20	520	590	570	500	-20	70
495	8.43	3/11/97	0 MAF Flushing	-140	-640	520	590	20	20	540	620	580	530	-20	60
495	8.43	3/11/97	1 MAF Flushing	-110	-530	320	490	20	20	340	510	390	420	-20	70
495	8.41	3/10/97	1.5 MAF Flushing	-100	-500	250	470	20	20	270	500	310	410	-10	70
495	8.41	3/10/97	Max Wheeling	-140	-700	440	560	50	120	490	680	500	500	-20	70
495	8.45	3/21/97	4.7 MAF Surrogate Demand	-120	-810	460	770	20	20	480	790	510	750	-10	30
495	8.45	3/21/97	3.5 MAF SWP Demand	-120	-250	510	190	20	30	520	220	580	70	-20	120
495	8.45	3/25/97	Oroville Balancing	-130	-620	520	570	20	20	550	600	600	520	-40	60
495	8.44	3/14/97	7000 cfs NDO, 75/25	-130	-590	400	550	-20	20	380	570	460	480	-10	70
495	8.45	3/20/97	7000 cfs NDO, 67/33	10	-580	330	520	40	40	370	570	420	450	-10	70
495	8.44	3/14/97	9000 cfs NDO, 75/25	350	-470	260	490	-230	-30	30	460	350	420	-10	70
495	8.45	3/24/97	9000 cfs NDO, 50/50	380	-470	-100	400	90	60	-20	470	50	330	-10	80
495	8.44	3/14/97	11000 cfs NDO, 75/25	800	-340	160	430	-630	-100	-480	330	240	370	0	70
495	8.46	3/31/97	11000 cfs NDO, 57/43	800	-330	-190	340	-250	-10	-450	340	-20	280	-10	70

[1] benefits measured against Study 472 benchmark
[2] total includes "addwater" benefits from SJR tributary storage

DWR Modeling Support Branch 4/9/97

PRELIMINARY DWRSIM STUDY RESULTS
WATER SUPPLY BENEFITS OF CALFED STORAGE & CONVEYANCE FACILITIES

Study Information			Storage/Conveyance	Delta Exports (TAF/yr) [1]						SWP Deliveries (TAF/yr) [1]			
				SWP		CVP		Total [2]		Entitlement		Interruptible	
ID	Ver	Date	Components	critical	73-yr	critical	73-yr	critical	73-yr	critical	73-yr	critical	73-yr
472B	8.41	3/5/97	SDI	80	180	0	20	80	200	80	90	10	90
472E	8.41	3/11/97	Max Wheeling	0	0	0	30	0	30	0	0	0	0
472F	8.41	3/11/97	Max Wheeling + SDI	80	180	0	110	80	290	70	90	10	90
475	8.41	3/6/97	5,000 cfs IF + SDI	160	260	-10	40	160	310	140	110	40	150
493	8.41	3/10/97	15,000 cfs IF + SDI	170	260	-10	50	170	320	140	120	40	150
494	8.41	3/6/97	NDSS	470	400	20	-20	480	380	550	470	-40	-60
495	8.41	3/6/97	NDSS + SDI	500	560	20	20	520	590	570	500	-20	70
496	8.41	3/7/97	NDSS + IF + SDI	650	690	10	50	660	750	690	560	20	130
497	8.41	3/7/97	SDSS	10	90	10	-30	20	70	140	210	-40	-130
498	8.41	3/7/97	SDSS + SDI	140	360	20	20	150	380	430	410	-40	-80
499	8.41	3/7/97	SDSS + IF + SDI	270	480	10	50	290	530	580	490	-30	-60
500	8.44	3/14/97	NDSS + SDSS + IF + SDI	740	720	0	50	750	780	1100	680	-30	-20

[1] benefits measured against Study 472 benchmark
[2] total includes "addwater" benefits from SJR tributary storage

Operating Parameters

DRAFT

Note: These operating parameters have been developed to provide a preliminary basis for conducting system and Delta model studies of CALFED alternatives. They do not reflect the culmination of the consensus process. A wide range of operating parameters will eventually be explored as part of the alternative evaluation process.

The operating Parameters and assumptions established for preliminary evaluation of the 3 CALFED alternatives with various configurations are as described in "DWR Planning Simulation Model (DWRSIM) Assumptions for CALFED Benchmark Study 1995C6F-CALFED-472, except as superseded or supplemented by the following:

1. All Surface and Groundwater Storage Components

All new surface storage facilities are operated to maximize average annual yield.

All new groundwater and conjunctive use facilities are operated to maximize driest year yield.

- Tributary groundwater storage facilities have first priority for filling and fifth priority for discharging from storage.
- Aqueduct groundwater storage facilities have second priority for filling and fourth priority for discharging from storage.
- Aqueduct surface storage facilities have third priority for filling and third priority for discharging from storage.
- Tributary surface storage facilities have fourth priority for filling and second priority for discharging from storage.
- Delta storage facilities have fifth priority for filling and first priority for discharging from storage.

All new storage is assumed to be split evenly among the "three sectors", such that we have 1/3 for environmental purposes, 1/3 for urban purposes, and 1/3 for agricultural purposes.

For 500 TAF of groundwater storage, diversion capacity is 500 cfs. Discharge capacity is 500 cfs. No flow event target must be met for diversions to groundwater storage.

For Tributary Storage (Sacramento River System) diversions to storage:

All proposed in stream flow requirements must be met before diversions to new storage are allowed.

Assumed diversion and discharge capacity for off stream storage is 5,000 cfs.

For diversion points between Keswick and Chico Landing, no diversions allowed in any given water year until a flow event of at least 60,000 cfs, mean daily flow has occurred at Chico Landing. For the monthly time step used in modeling, a corresponding monthly volume of 1.5 million acre feet is required.

For diversion points at and downstream of Chico Landing, no flow event target is established.

For Tributary Storage (San Joaquin River System) diversions to storage:

New storage is assumed to be diverted from existing canal diversion locations or assumed to be an increase of existing on stream storage. No flow event targets set.

For Aqueduct Storage:

New storage is assumed to be connected to the California Aqueduct with 3,500 cfs diversion and discharge capacity.

2. In stream Flow Targets:

ERPP targets are to be met through purchase of existing water and use of the new storage allocated to environmental water supplies.

3. Delta Standards:

For isolated conveyance alternatives assume:

Rio Vista Flow Standard not to fall below 4,500 cfs all months, all year types.

Delta Cross Channel closed September through June, open July through August.

Isolated facilities should be operated to maximize isolated conveyance year round, consistent with the need to meet south Delta water quality objectives. The minimum levels of monthly export flows taken through the south Delta export facilities are suggested as follows:

October-March	1,000 cfs
April-June	0 cfs
July-September	1,000 cfs

Isolated flow is assumed to be exempt from both export and inflow in E/I ratio (with some

potential modification of the E/I ratio proposed by Dave Fullerton).

file buer\op_param.wpd, wp6.1, 4/22/97

Delta Modeling in Support of CalFed Storage and Conveyance Analysis

April 24, 1997

What has been done.

1. Five Configurations: Existing, Interim South Delta Program, North Delta Program, North Delta with Hood Diversion, and CUWA alternatives.

2. Used April and May of 1989 hydrology adjusted to reflect the 1995 SWRCB control plan. Sacramento River ranges from over 40,000 cfs to 10,000 cfs and SWP/CVP combined export 10,000 cfs to 2,000 cfs.

3. Three periods were used. They were April 1-15, April 16-30, and May 1-31.

4. Outputs were: 1) Flows and Velocities for the entire Delta, and 2) Flows and Stages in the Central and Southern Delta.

5. Mass Tracking Studies.

   1) May hydrology was used.
   2) Transports after 15 and 30 days were reported.
   3) Three injection points were used.

6. Comparison of two modes of Delta model simulations was documented.

7. Chain of Lakes alternative.

   1) Eight lakes
   2) Siphons only connection
   3) Siphons and pumps connection
   4) Hydraulics analysis only

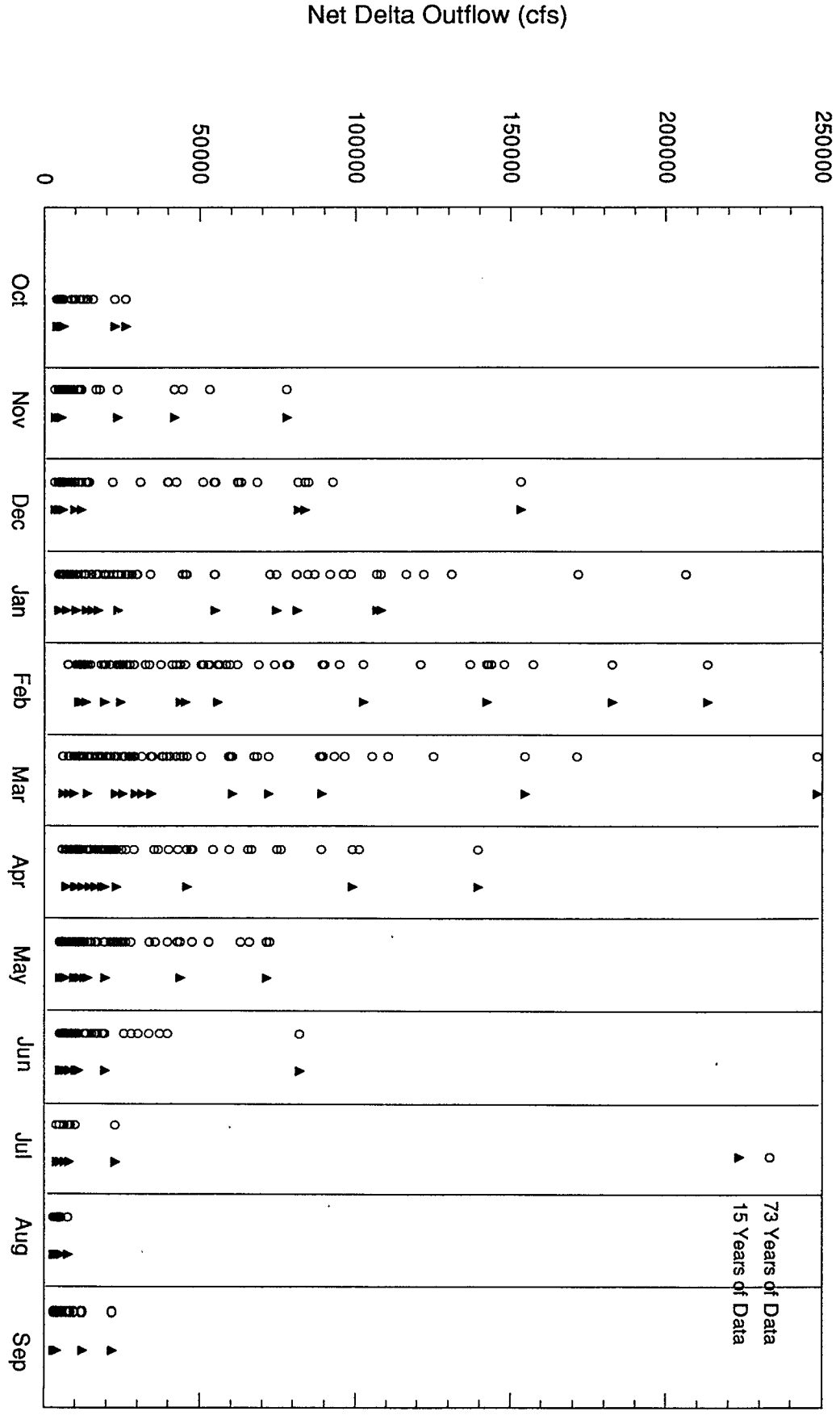
Ongoing Efforts

1. Multiple intakes alternative

   1) Western, northern, and eastern intakes
   2) Each intake with 15,000 cfs capacity
   3) Maximum water level in the channel is +6 feet above mean sea level
   4) Minimum water level in the CCFB is -2 feet
   5) Maximum channel velocity is 3 fps
   6) Maximum siphon velocity is 15 fps
   7) Siphons only or siphons with pumps

2. Isolated Facilities, different configurations and capacities.

3. 16 year simulations (out of DWRSIM 472) for alternative 1A, 1C, and 2A.



4/24/97

D-006097

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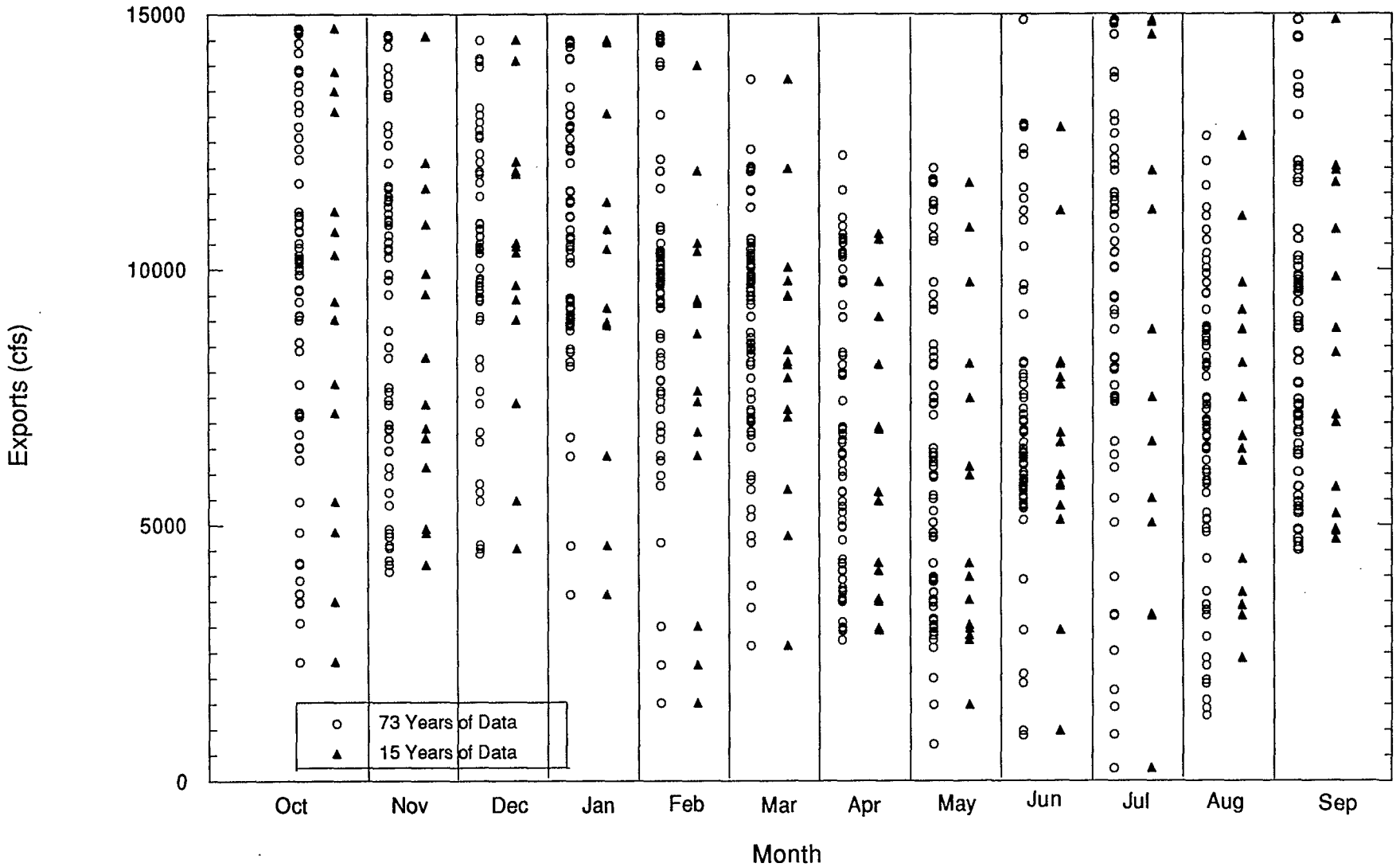
The Comparison of Ranges of Pumping (CVP + SWP) between (1922-1994) and (1977-1991)
STUDY 472B



Update

DSM1 Suisun Marsh Version Re-calibration

DWR Suisun Marsh Branch

April 24, 1997

D-006099

- Internet Web Site

- DSM1 (SMVers.) Hydrodynamics Re–calibration status

- DSM1 (SMVers.) Salinity Model Re–calibration status

- Discussion: How Should We Proceed From Here?

Web Access to Re-calibration Results

All re-calibration progress is being shared through the Interagency Ecological Program home page. Maintenance of the home page is a joint effort of IEP File Server staff and DWR staff. Calibration results are available as a link from the IEP home page at "**www.iep.water.ca.gov.**"

The web site now includes links to:

- DSM1 Hydrodynamics Re-calibration results
- DSM1 Salinity Re-calibration results
- Manning's n and Dispersion Coefficient Groupings (Map)
- Three Mile Slough Bathymetry Data
- Background Documents

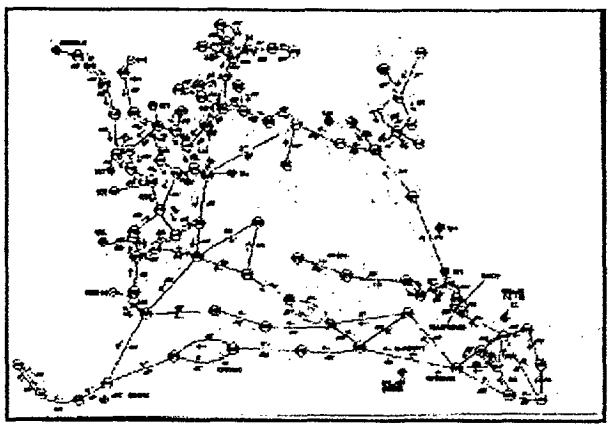
Comments are encouraged. An email reflector is available:

"dsm1cal.water.ca.gov"

D-006101

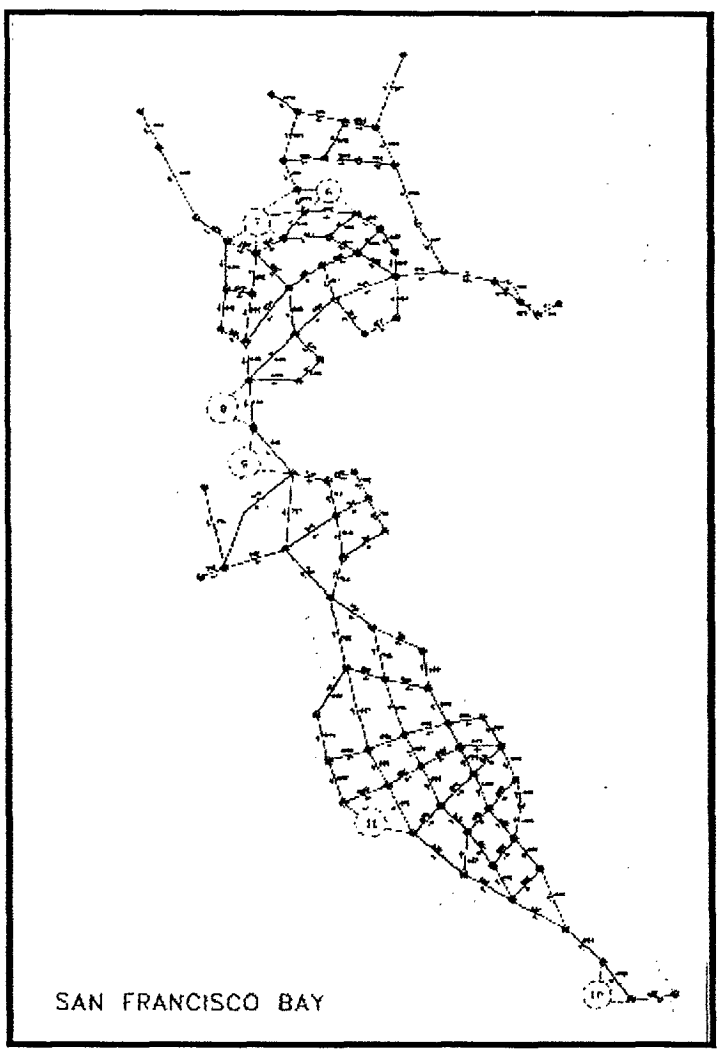
DSM1 Suisun Marsh Version Re-calibration

Suisun Marsh Grid Map

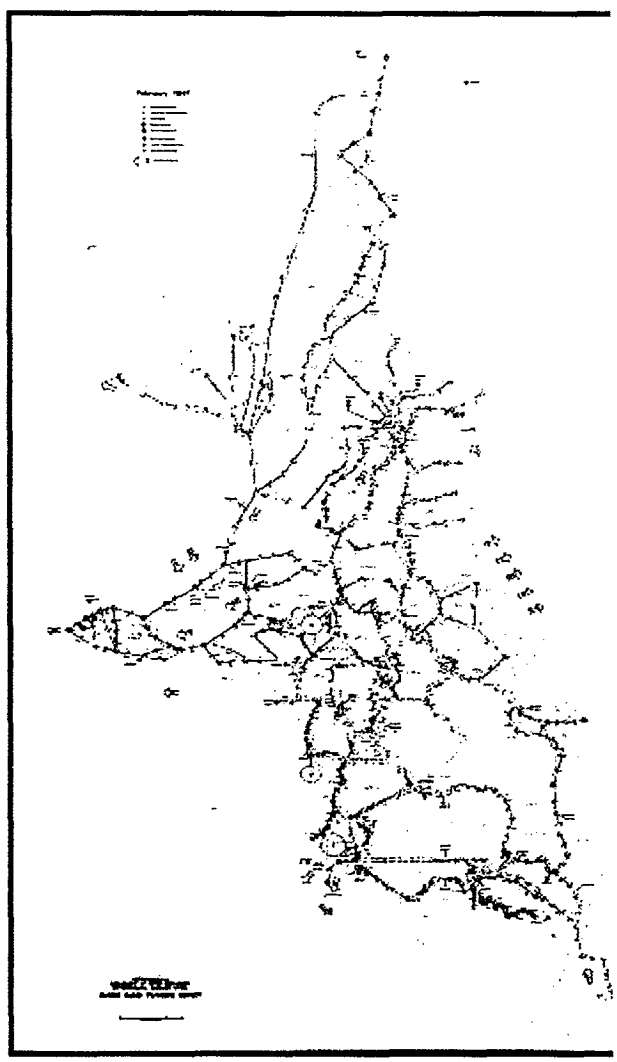


- ☐ DSM1 Hydro-calibration
- ☐ DSM1 Salinity-calibration
- ☐ Manning Coefficient Groups
- ☐ Three Mile Slough Info
- ☐ Background

San Francisco Bay



Delta Region



[STATUS REPORT] [PLOT DESCRIPTION] [EMAIL]

DSM1 Suisun Marsh Version Hydrodynamics Re-calibration Status

- 37 calibration runs were made for each of three historical periods: May 1988, January 1993, and May 1994.

- The calibration is based on 15-minute tidal flow and stage data, and 24.75 hour running average (residual) flow data.

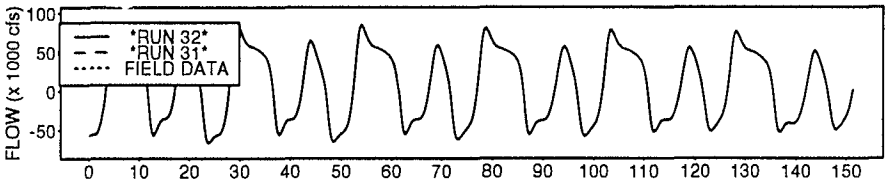
- The hydrodynamics calibration is essentially complete. We expect to make further adjustments in response to feedback from the salinity model calibration.

- Calibration results are being reviewed by USBR staff.

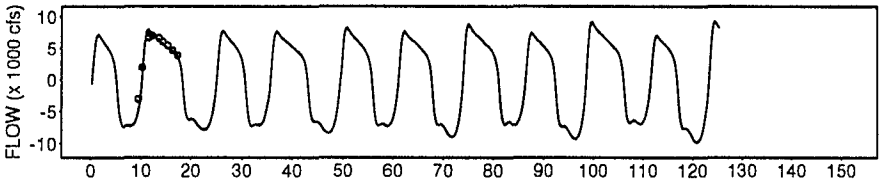
- Future Calibration Refinement Options:
  1) Calibrate model using latest UVM data
  2) Compare model flow-splits to empirical flow-split relations.
  3) Incorporate Three-Mile Slough survey data
  4) Identify areas of greatest calibration support needs.

D-006103

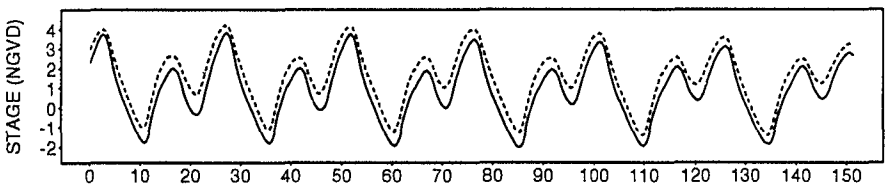
Rio Vista (430)



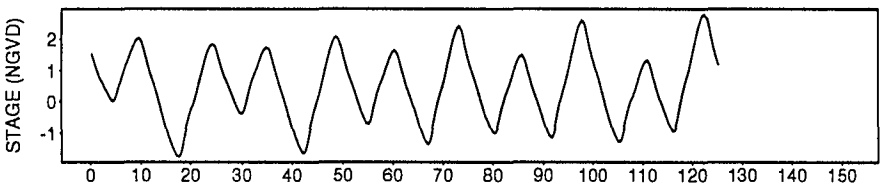
Dutch Slough (274)



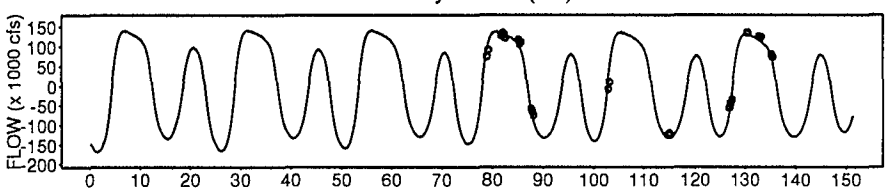
Rio Vista



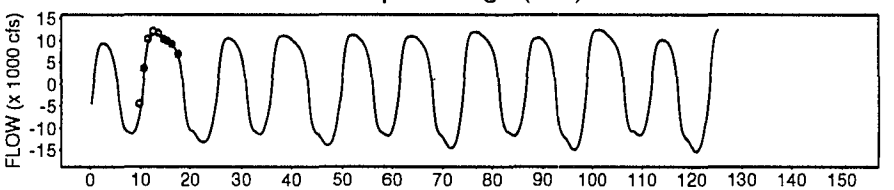
Dutch Slough



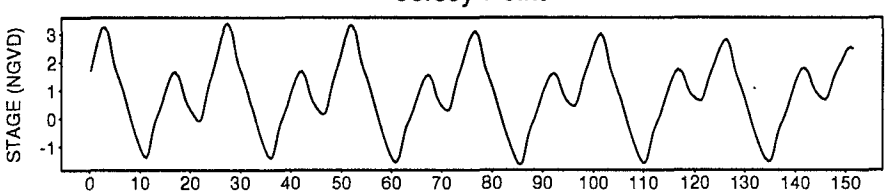
Jersey Point (49)



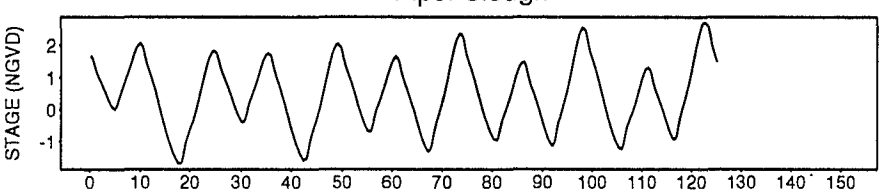
Piper Slough (270)



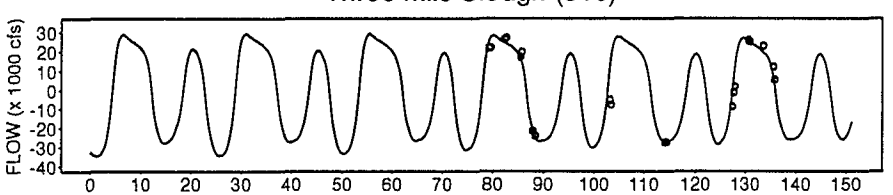
Jersey Point



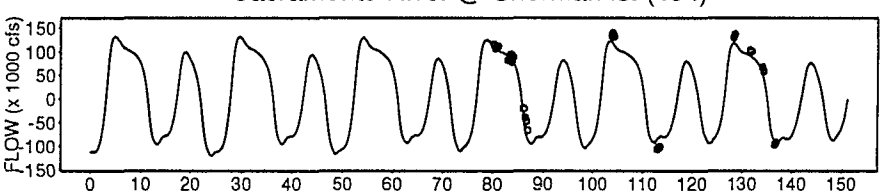
Piper Slough



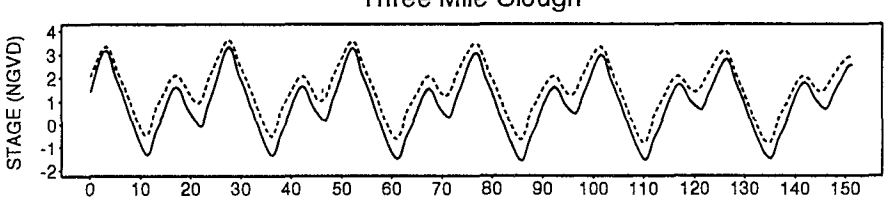
Three Mile Slough (310)



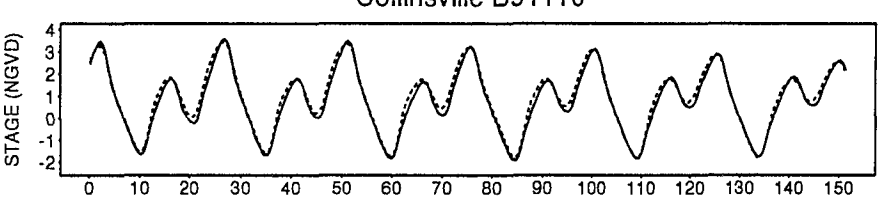
Sacramento River @ Sherman Is. (434)



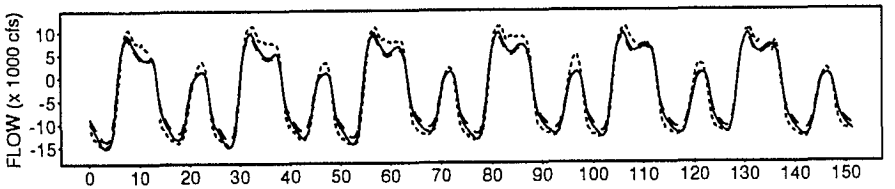
Three Mile Slough



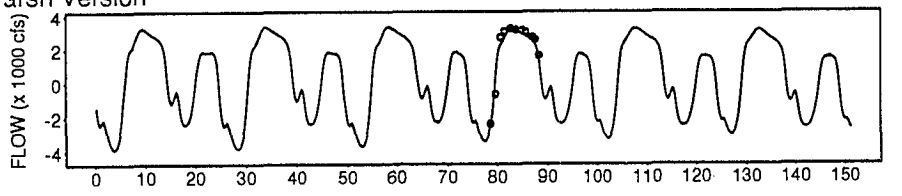
Collinsville B91110



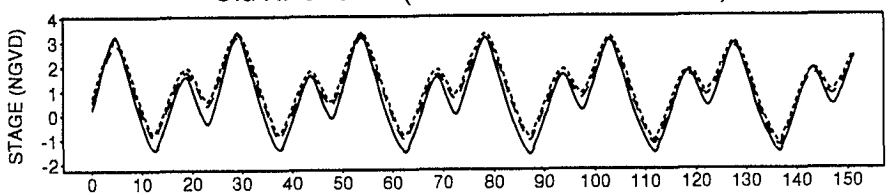
Old River UVM (106)



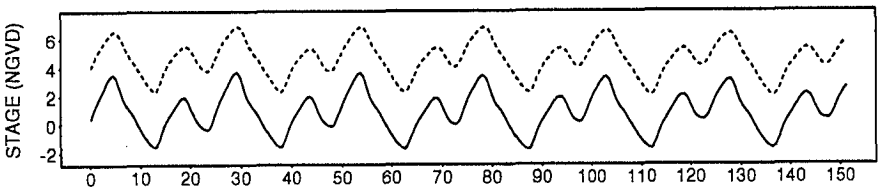
SJR @ HWY 4 (10)



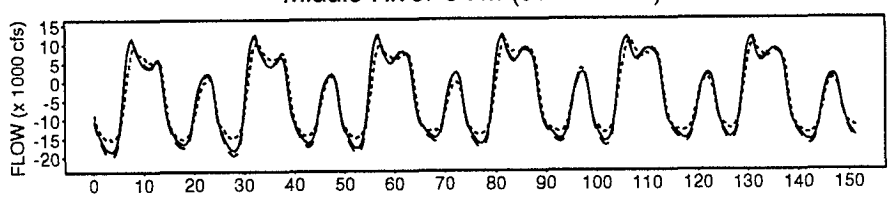
Old River UVM (DWR & USGS Field Data)



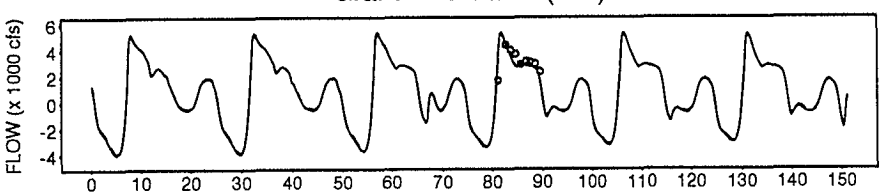
SJR @ Rindge Tract



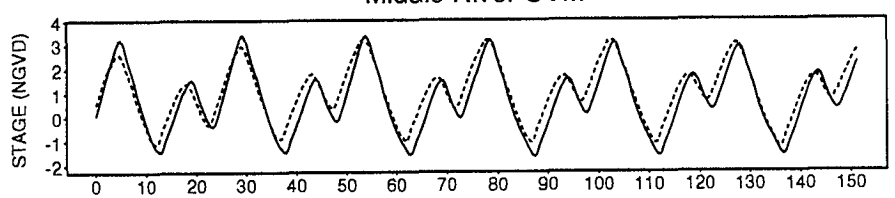
Middle River UVM (c144+c145)



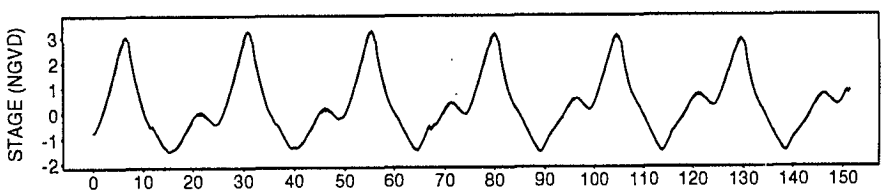
Grant Line Canal (206)



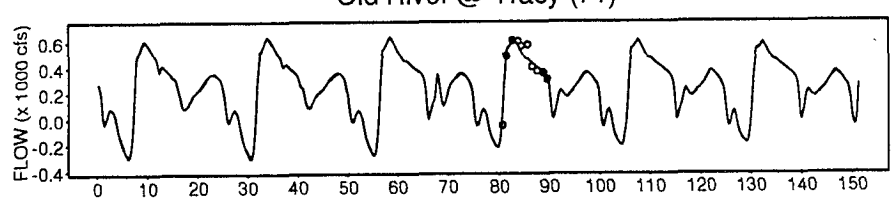
Middle River UVM



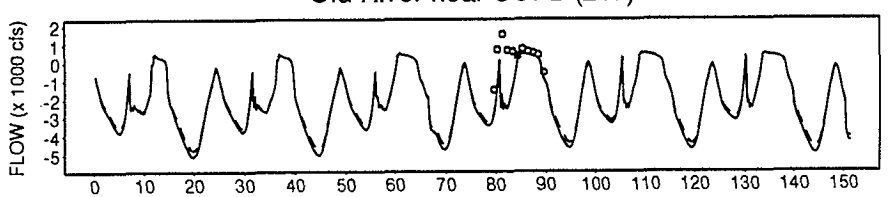
Grant Line Canal



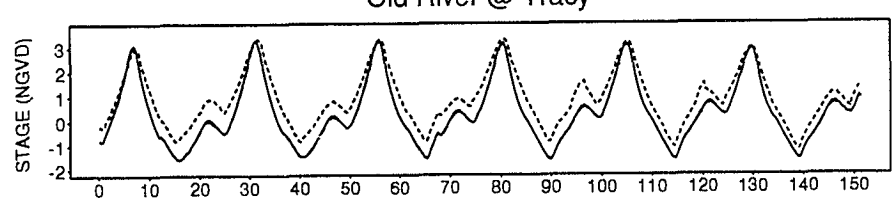
Old River @ Tracy (71)



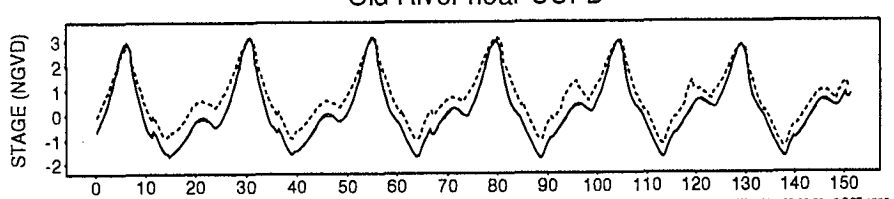
Old River near CCFB (217)

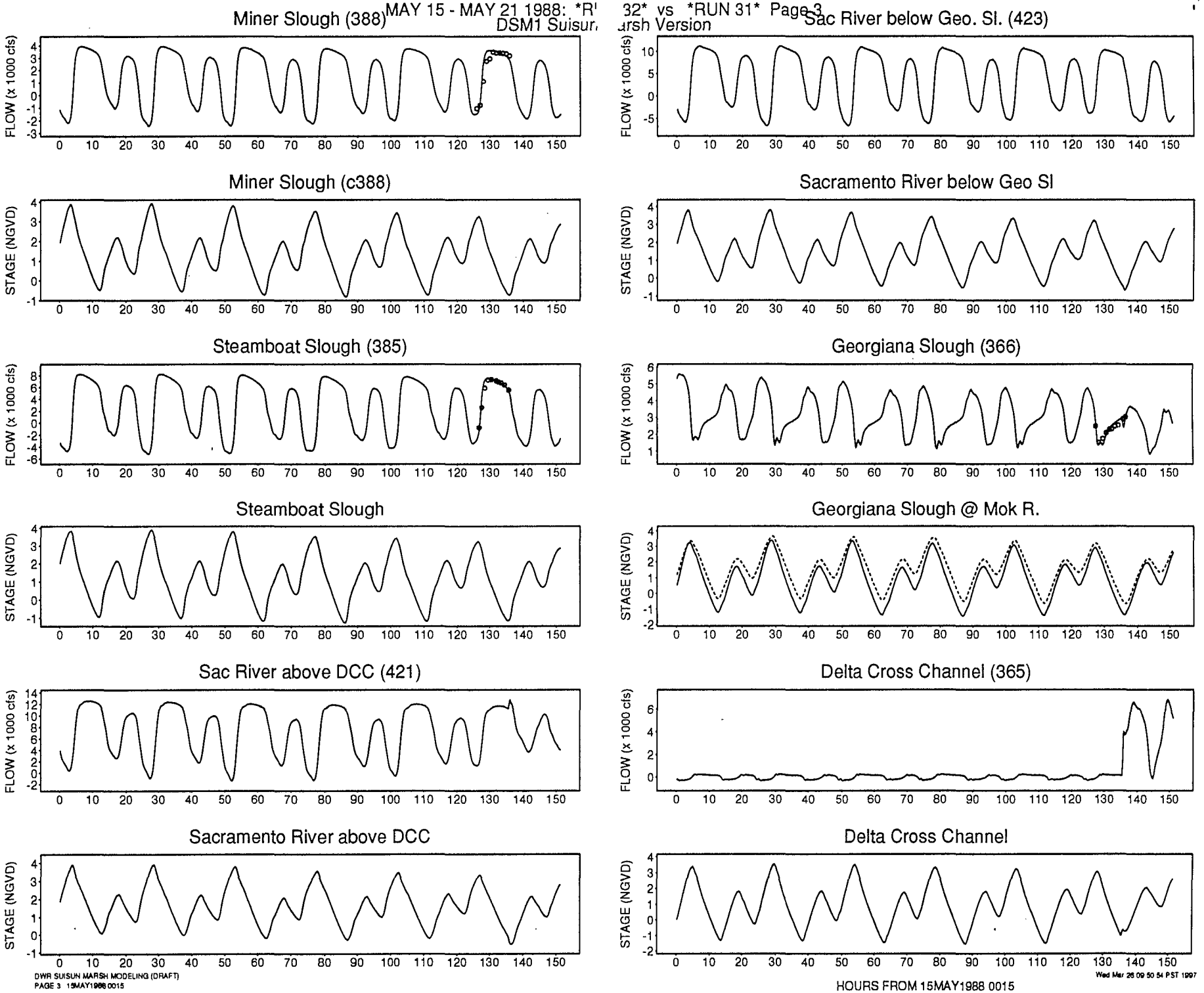


Old River @ Tracy

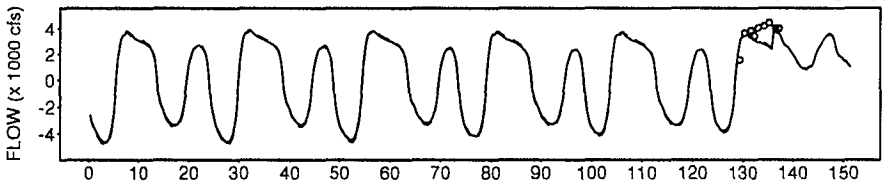


Old River near CCFB

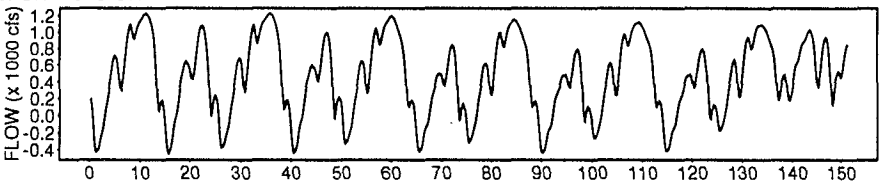




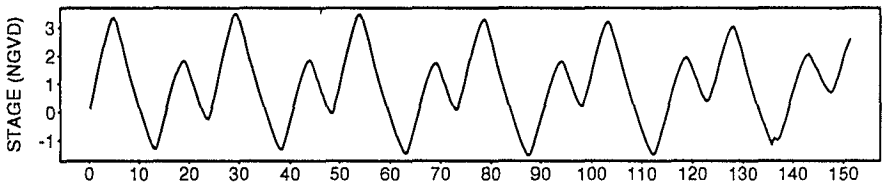
North Fork Mokelumne (357)



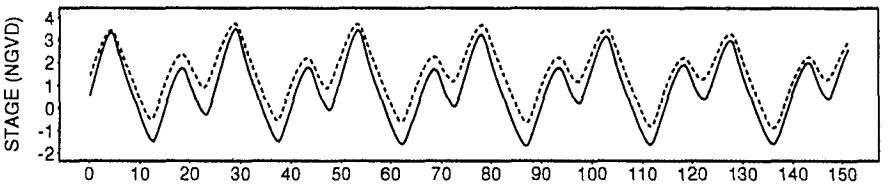
Honker Cut (318)



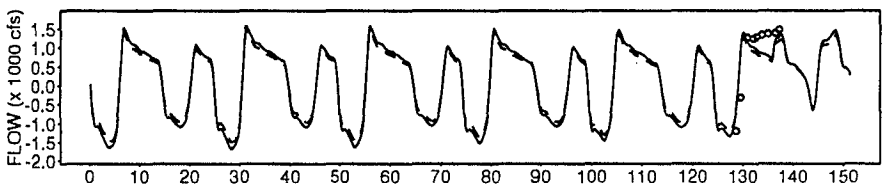
North Fork Mokelumne



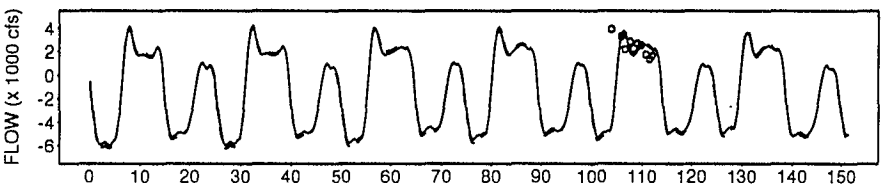
Little Connection Sl.



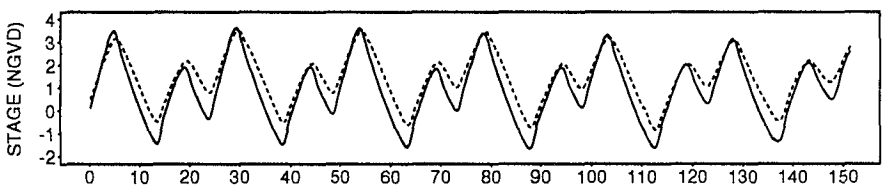
South Fork Mokelumne (337)



Columbia Cut (160)



South Fork Mokelumne



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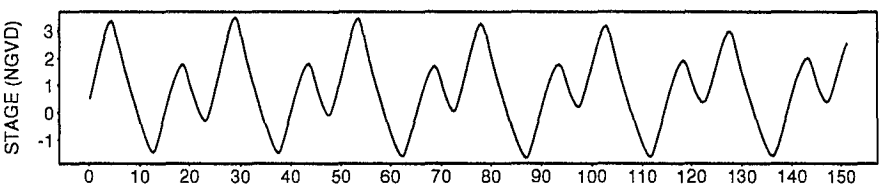
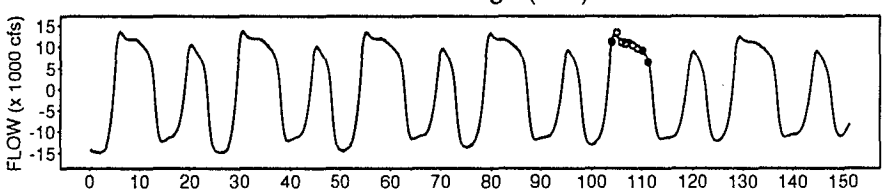
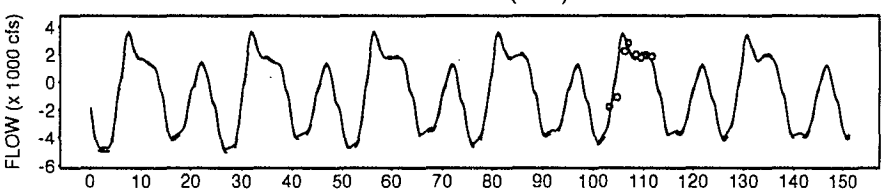


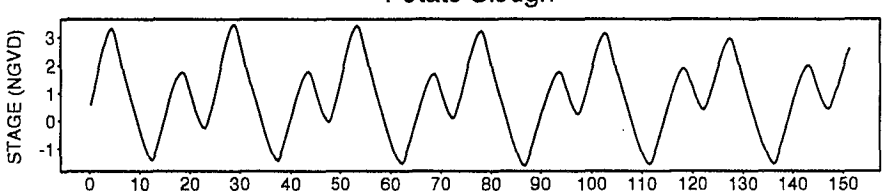
Potato Slough (326)



Turner Cut (172)



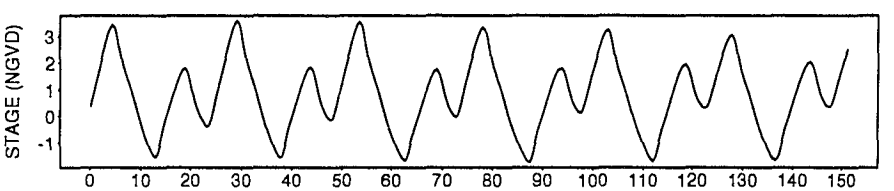
Potato Slough



DWR SUISUN MARSH MODELING (DRAFT)
PAGE 4 15MAY1988 0015

HOURS FROM 15MAY1988 0015

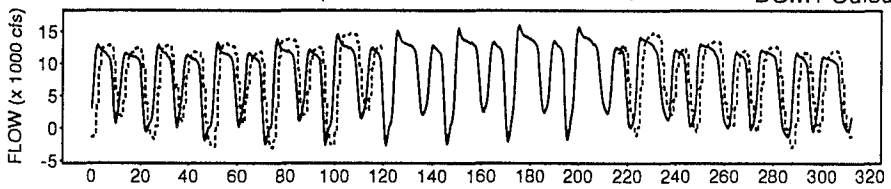
Turner Cut



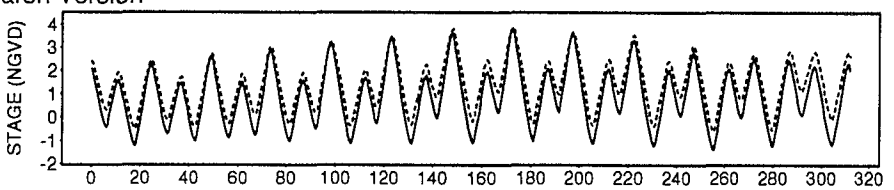
Wed Mar 26 09:51:01 PST 1997

HOURS FROM 15MAY1988 0015

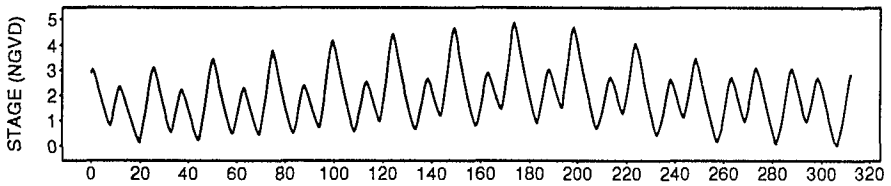
Sac River @ Freeport (414)



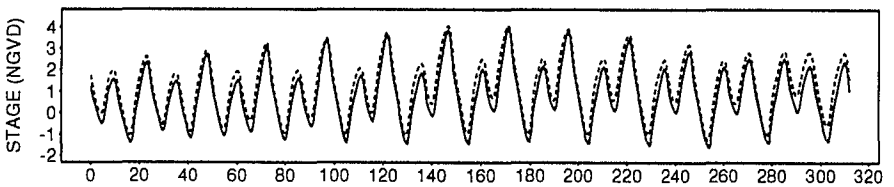
San Andreas



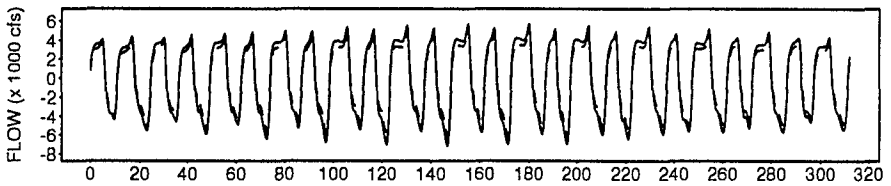
Sac River @ Freeport



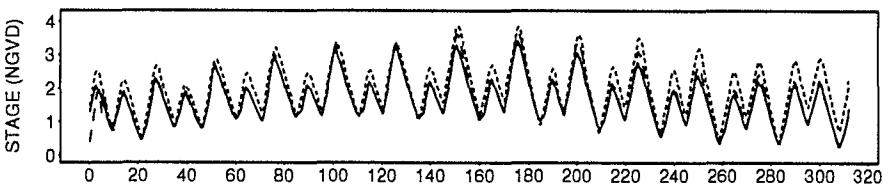
Antioch



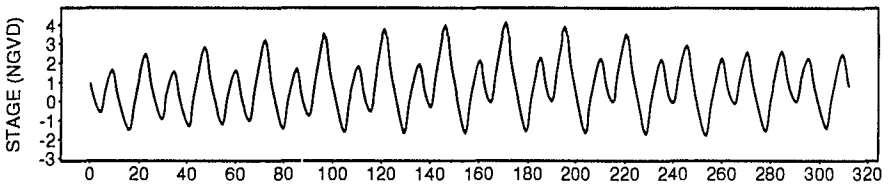
Montezuma Slough UVM



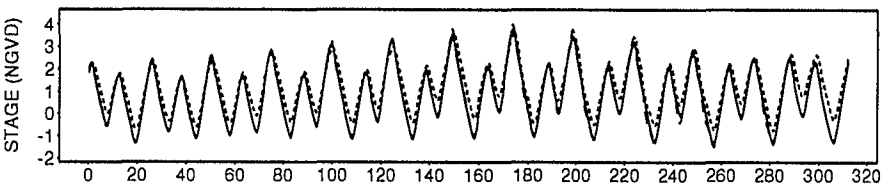
Old River Head



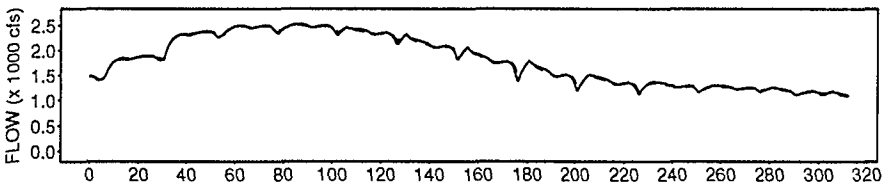
Montezuma Slough Gate



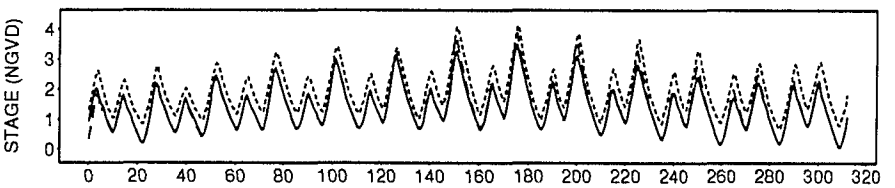
Old River @ Victoria



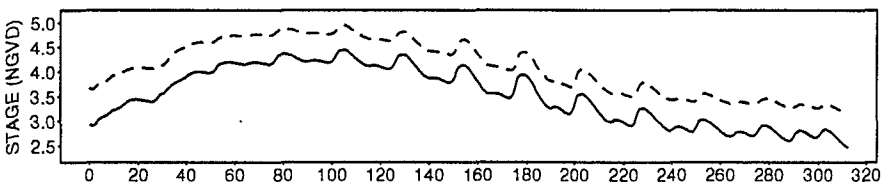
Vernalis



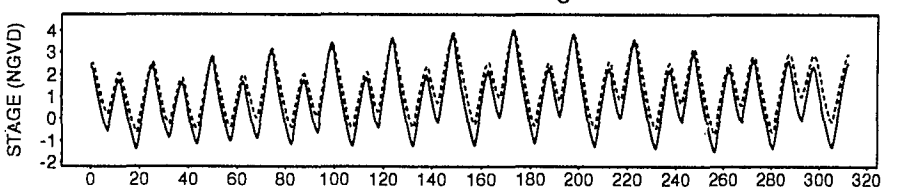
Middle River Head (125)



Vernalis



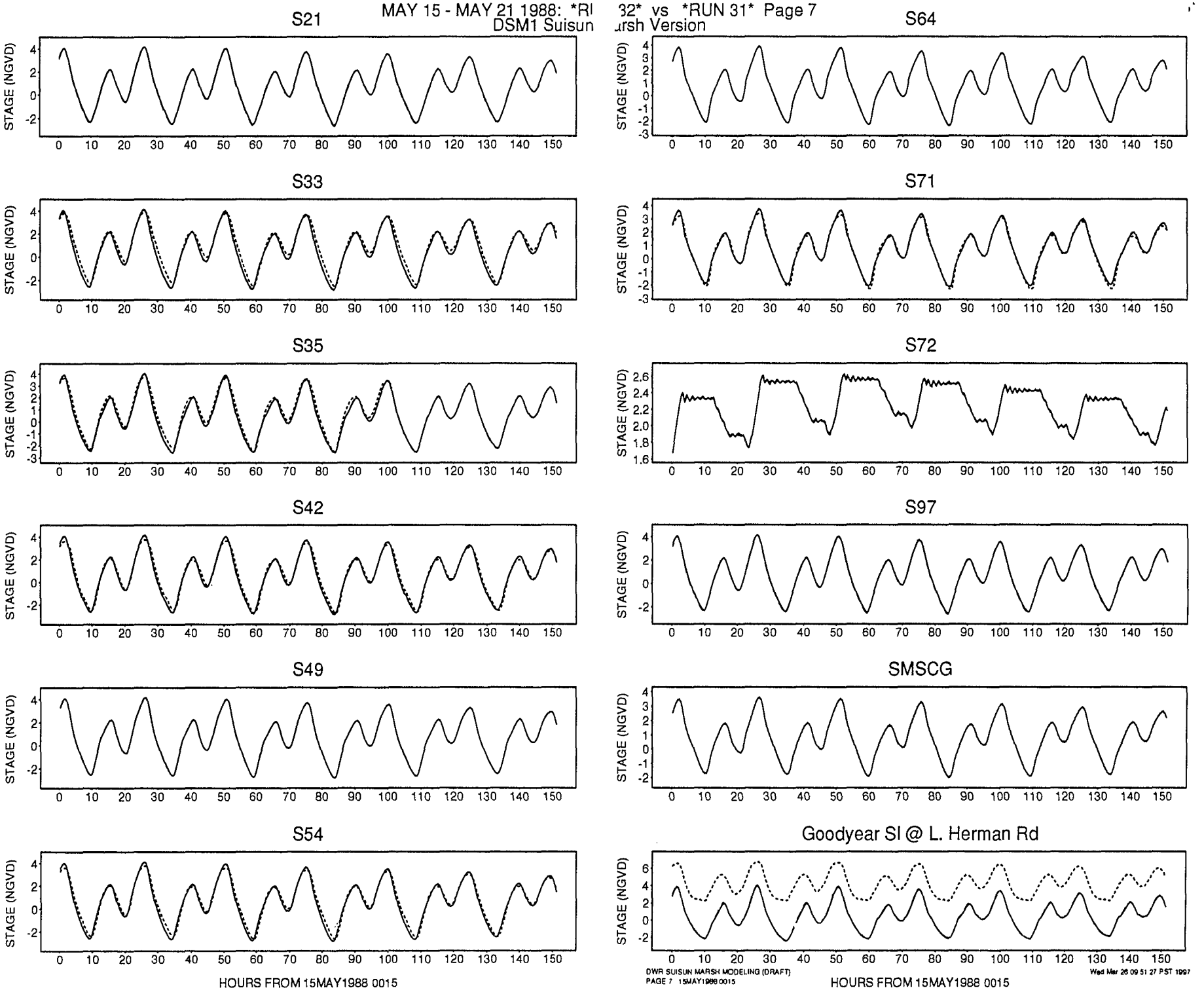
Connection Slough

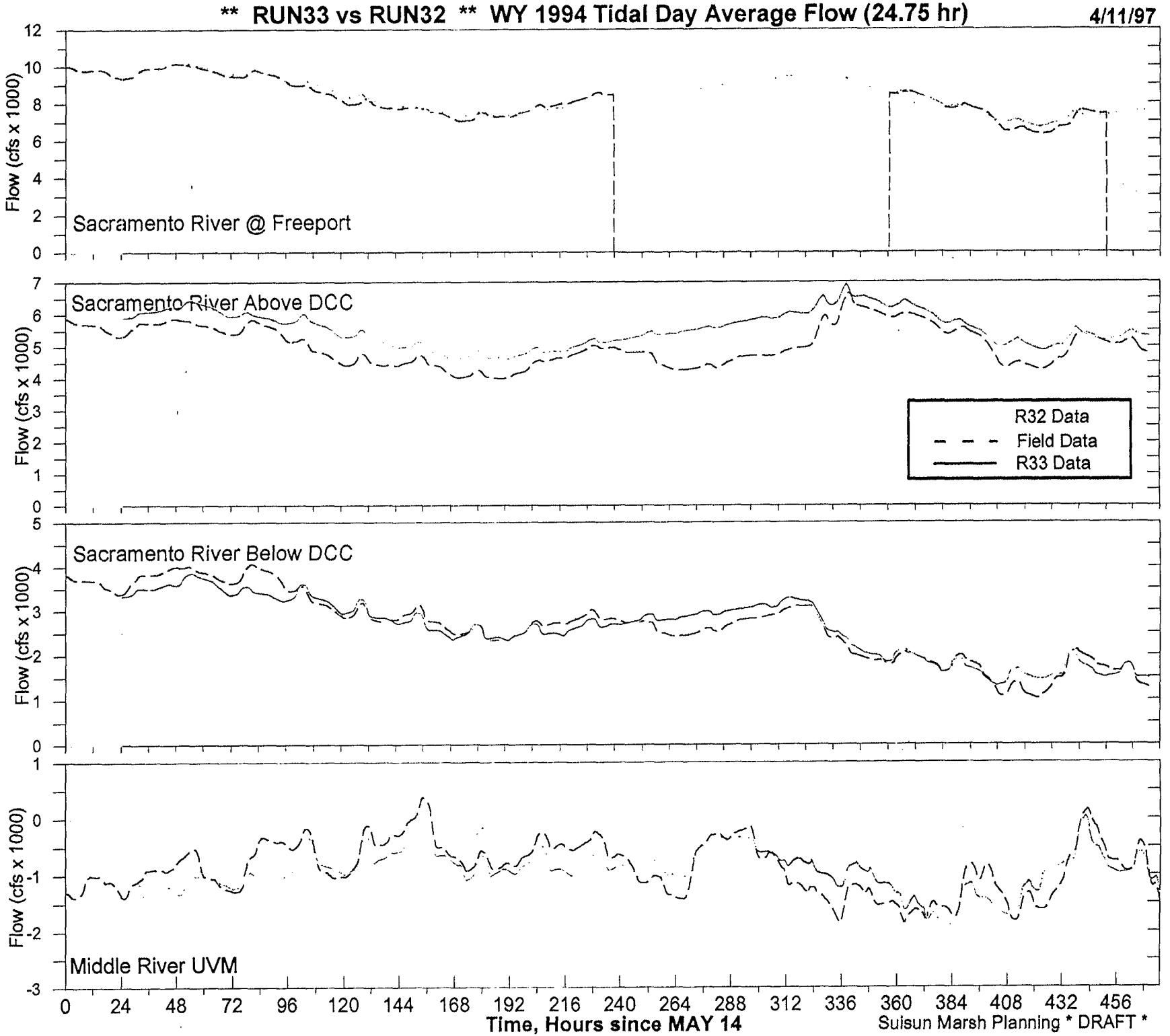


HOURS FROM 19MAY1994 0015

HOURS FROM 19MAY1994 0015

D-006108





DSM1 Suisun Marsh Version Salinity Model Re-calibration Status

Calibration period:

- Initialize model (warm up) using historical water year 1992 hydrology and facilities operations.

- Calibrate based on observed summer 1992 through September 1994 Suisun Bay/Marsh and Delta salinity.

Data:

- Use continuous EC converted to TDS data (water year type equation specific).
- Calibrate tidal day average salinity against 45 Marsh and Delta stations.

Calibraiton Strategy:

- Calibrate from west to east

Status:

- Nine three-year calibration runs have been made.
- Additional field data is being prepared

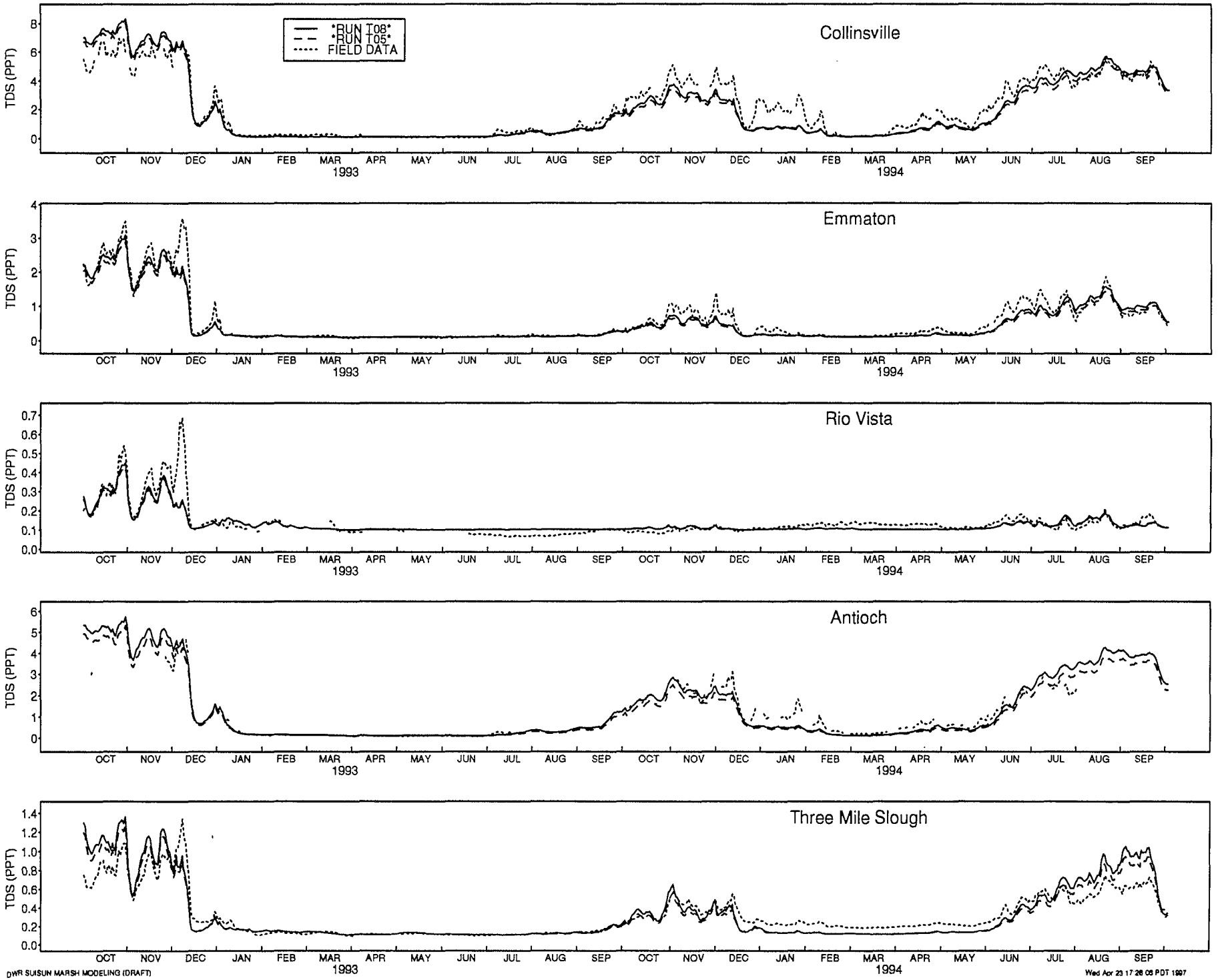
Work Remaining:

- About 1 month is needed for adequate salinity calibration. Subsequently, both hydrodynamics and salinity will be verified against an independent data set. A final report to CALFED will be prepared.

Discussion: Where to?

D-006111

DSM1 Suisun Marsh Version Re-calibration - Tidal Day Average Salinity; WATER YEARS 1993 & 1994: *RUN T08* vs *RUN T05* Page 1



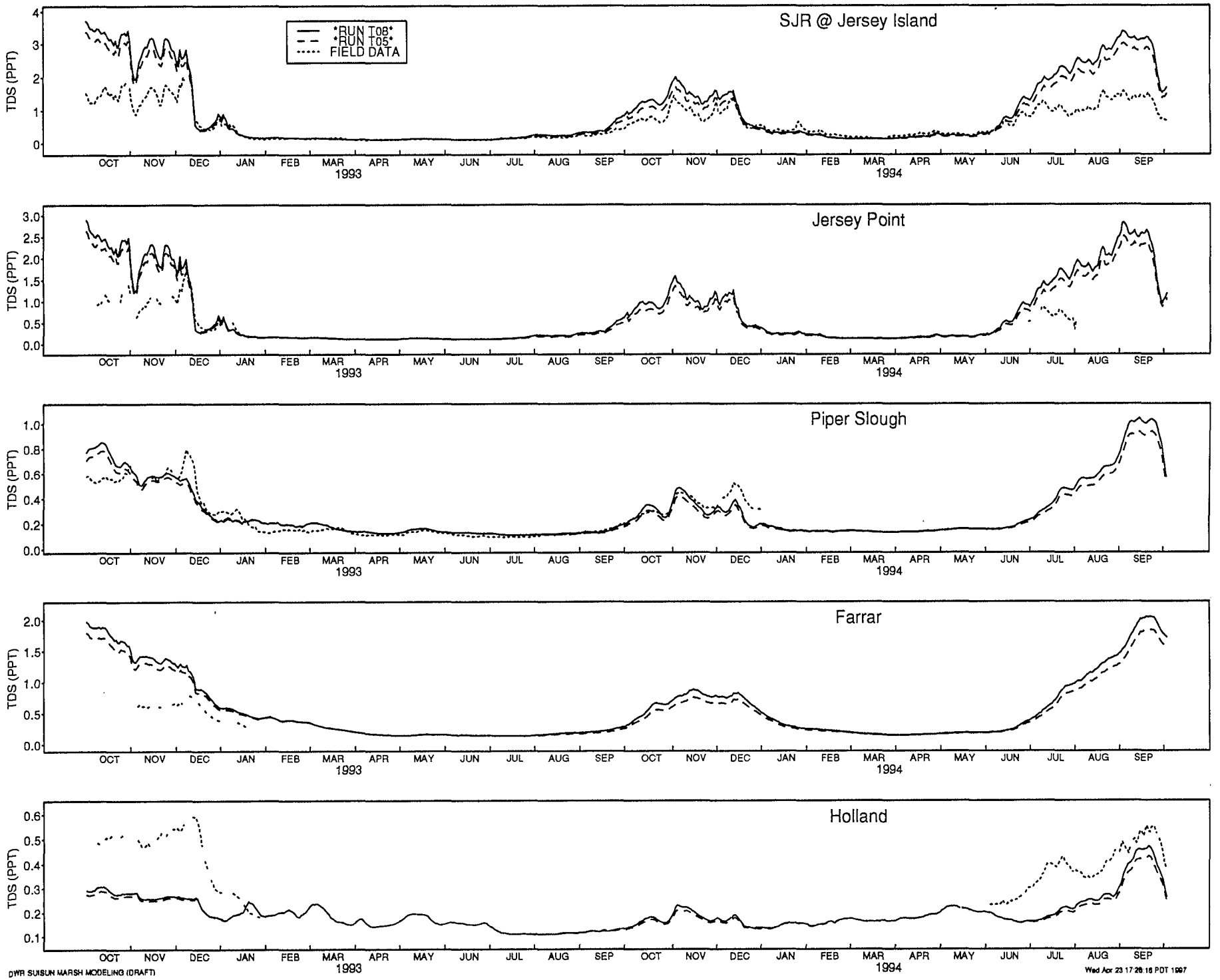
DWR SUISUN MARSH MODELING (DRAFT)

Wed Apr 23 17:26:05 PDT 1997

D-006112

D-006112

DSM1 Suisun Marsh Version Re-calibration - Tidal Day Average Salinity; WATER YEARS 1993 & 1994: *RUN T08* vs *RUN T05* Page 2



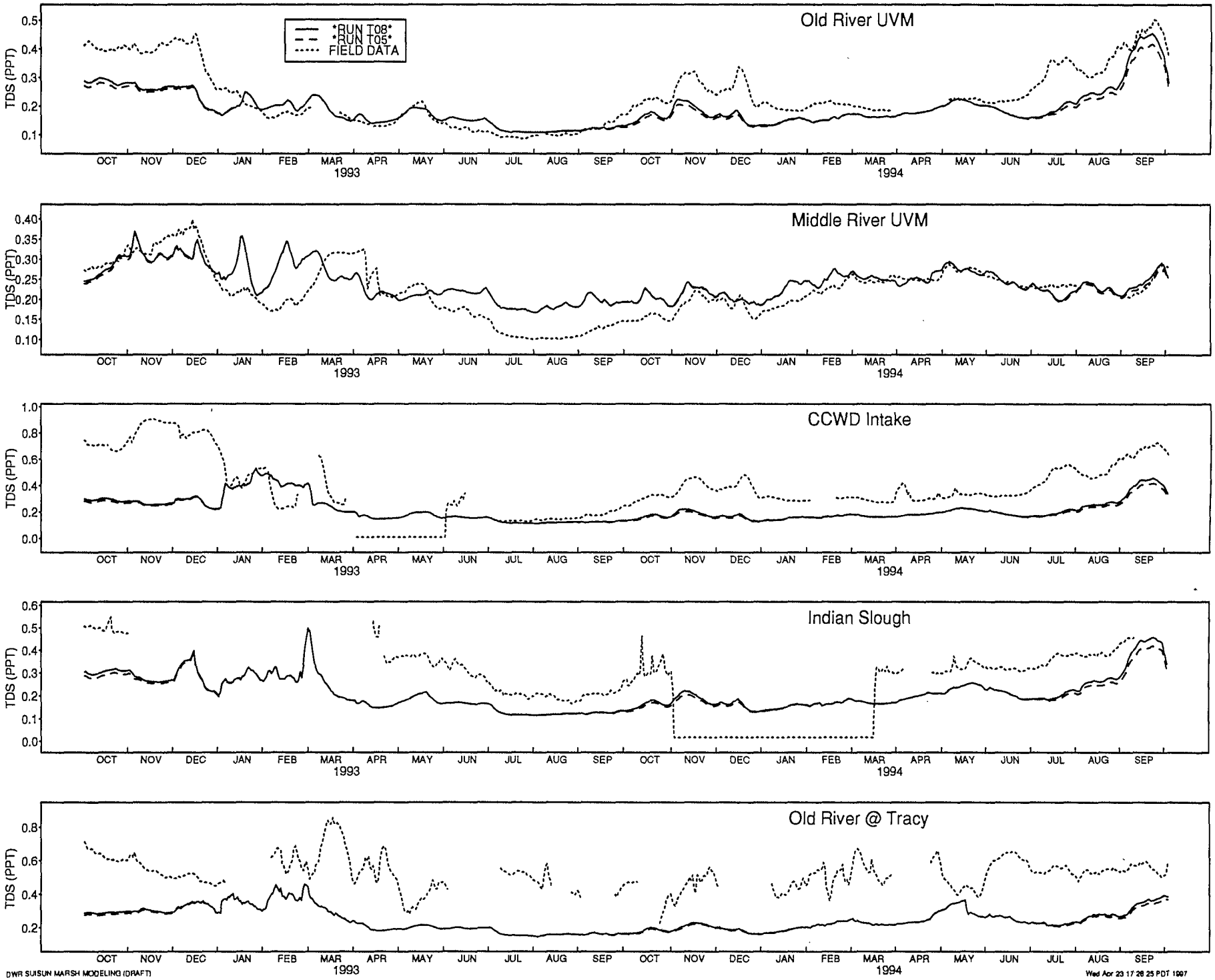
DWR SUISUN MARSH MODELING (DRAFT)

Wed Apr 23 17:26:16 PDT 1997

D-006113

D—0061 13

DSM1 Suisun Marsh Version Re-calibration - Tidal Day Average Salinity; WATER YEARS 1993 & 1994: *RUN T08* vs *RUN T05* Page 3

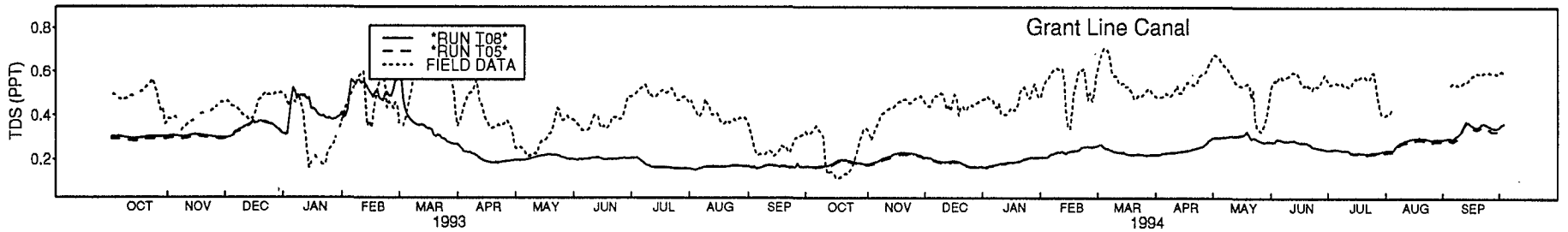


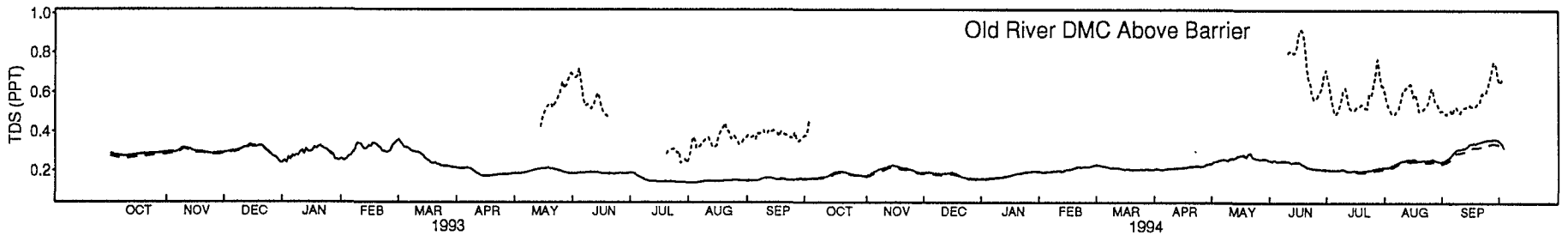
DWR SUISUN MARSH MODELING (DRAFT)

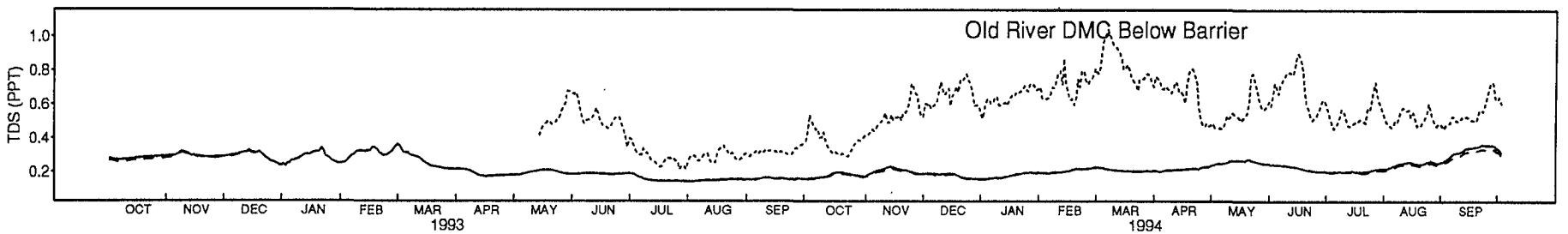
Wed Apr 23 17:26:25 PDT 1997

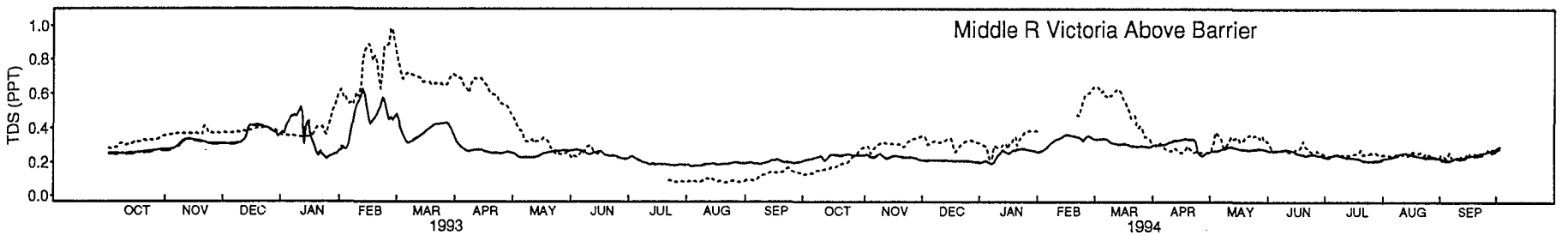
D-006114

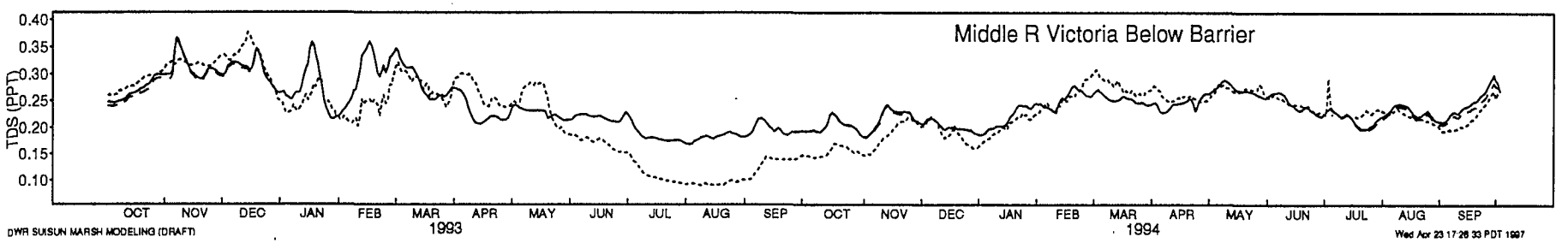
D—006114



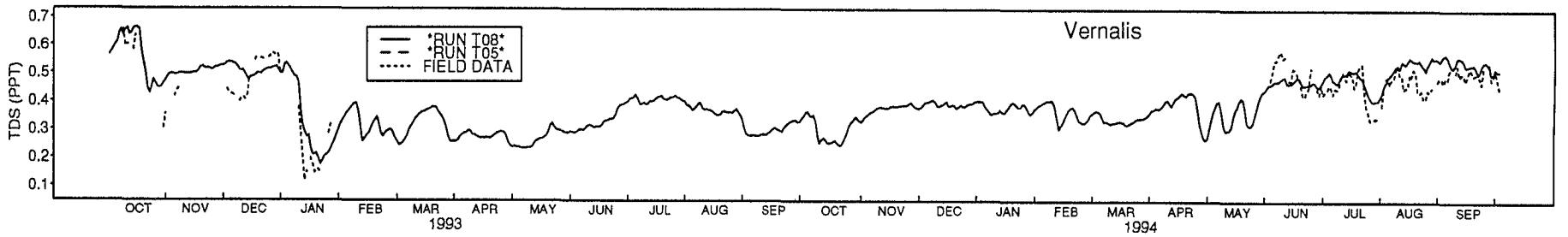


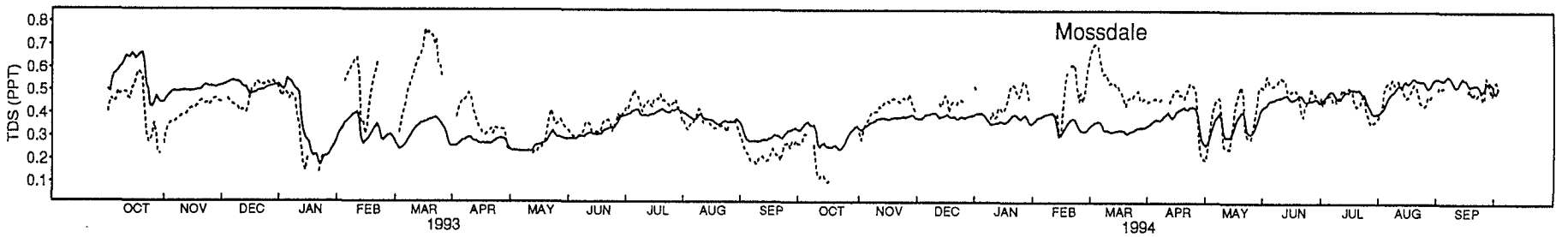


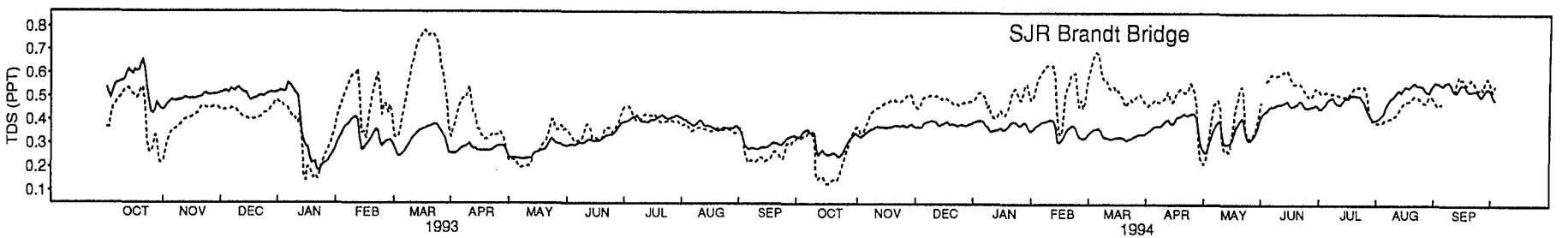


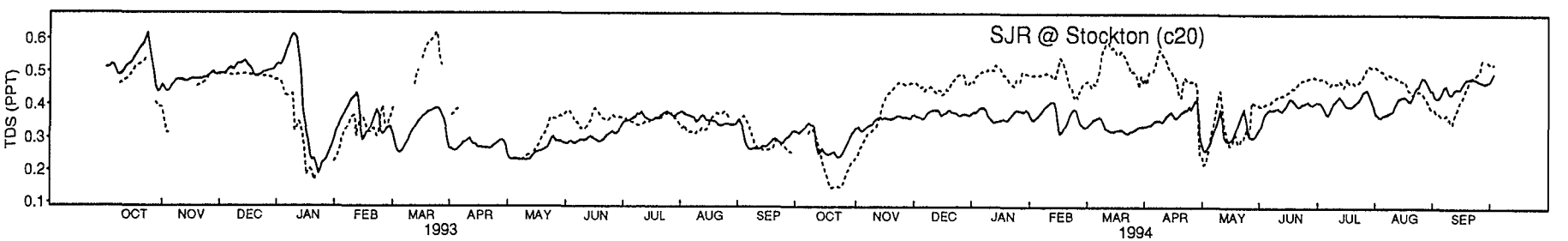


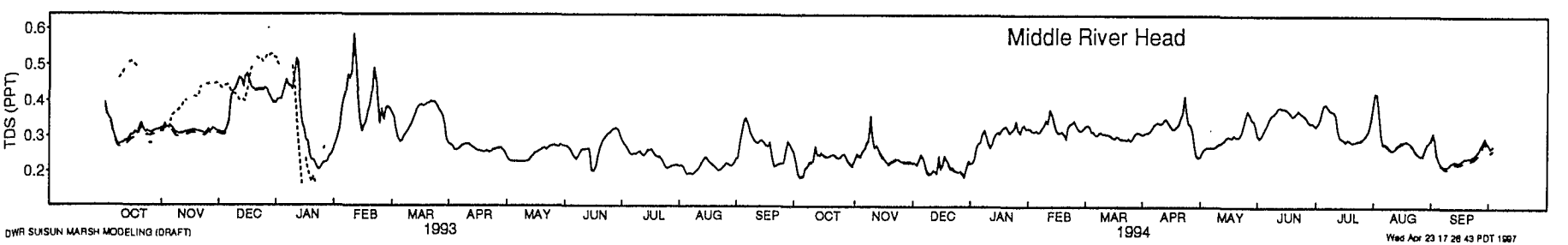
DSM1 Suisun Marsh Version Re-calibration - Tidal Day Average Salinity; WATER YEARS 1993 & 1994: *RUN T08* vs *RUN T05* Page 5









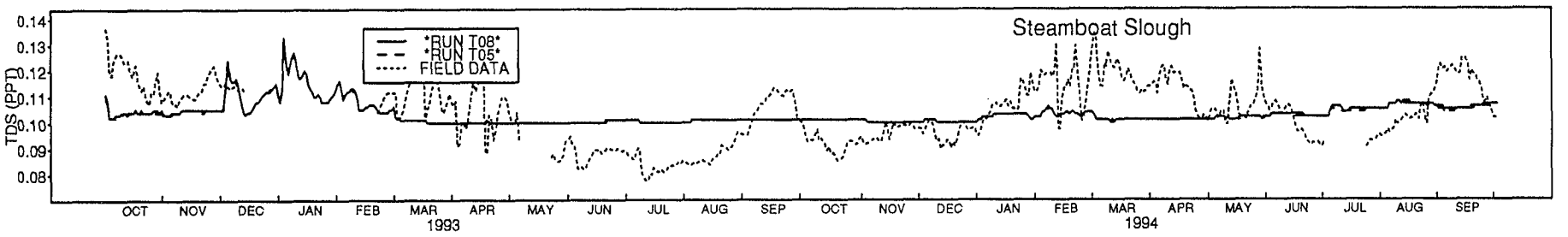


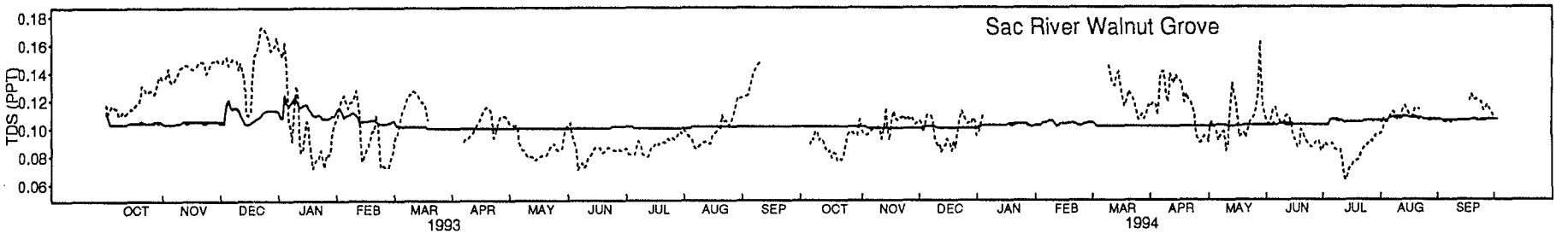
DWR SUISUN MARSH MODELING (DRAFT)

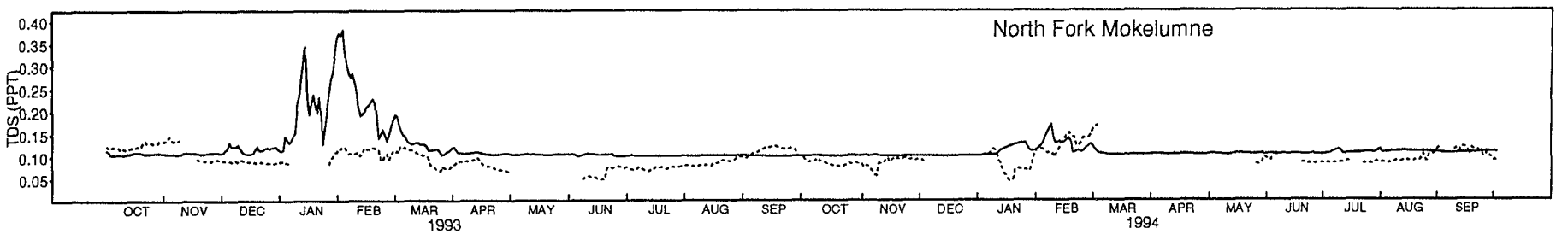
Wed Apr 23 17:26:43 PDT 1997

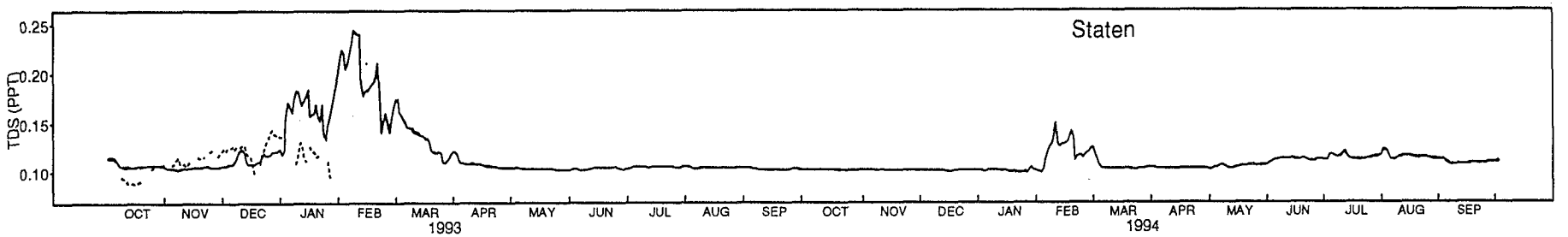
D-006116

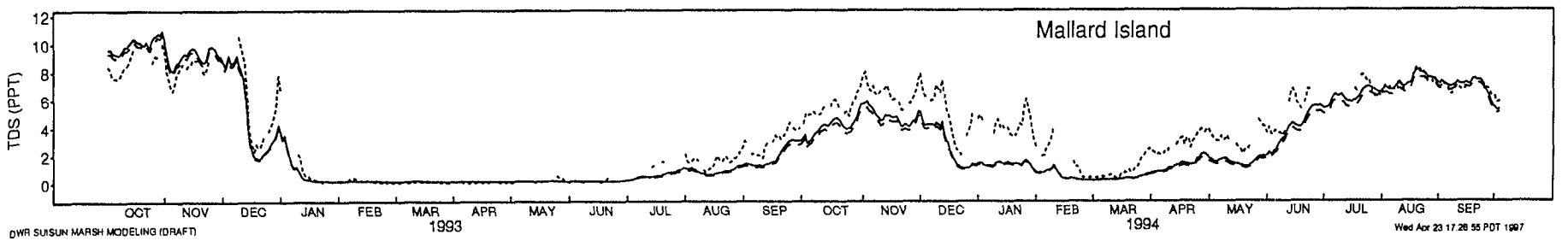
D-006116



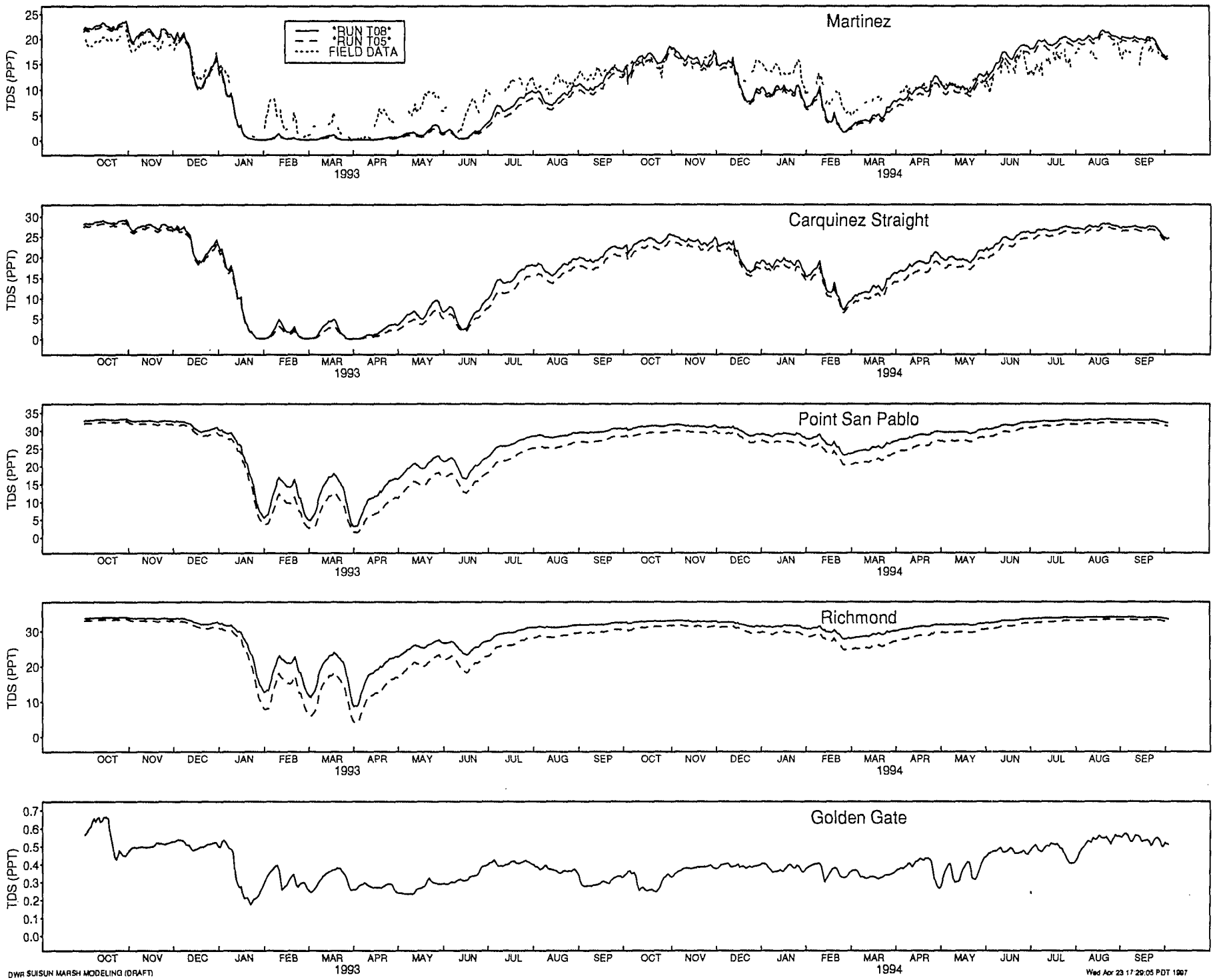


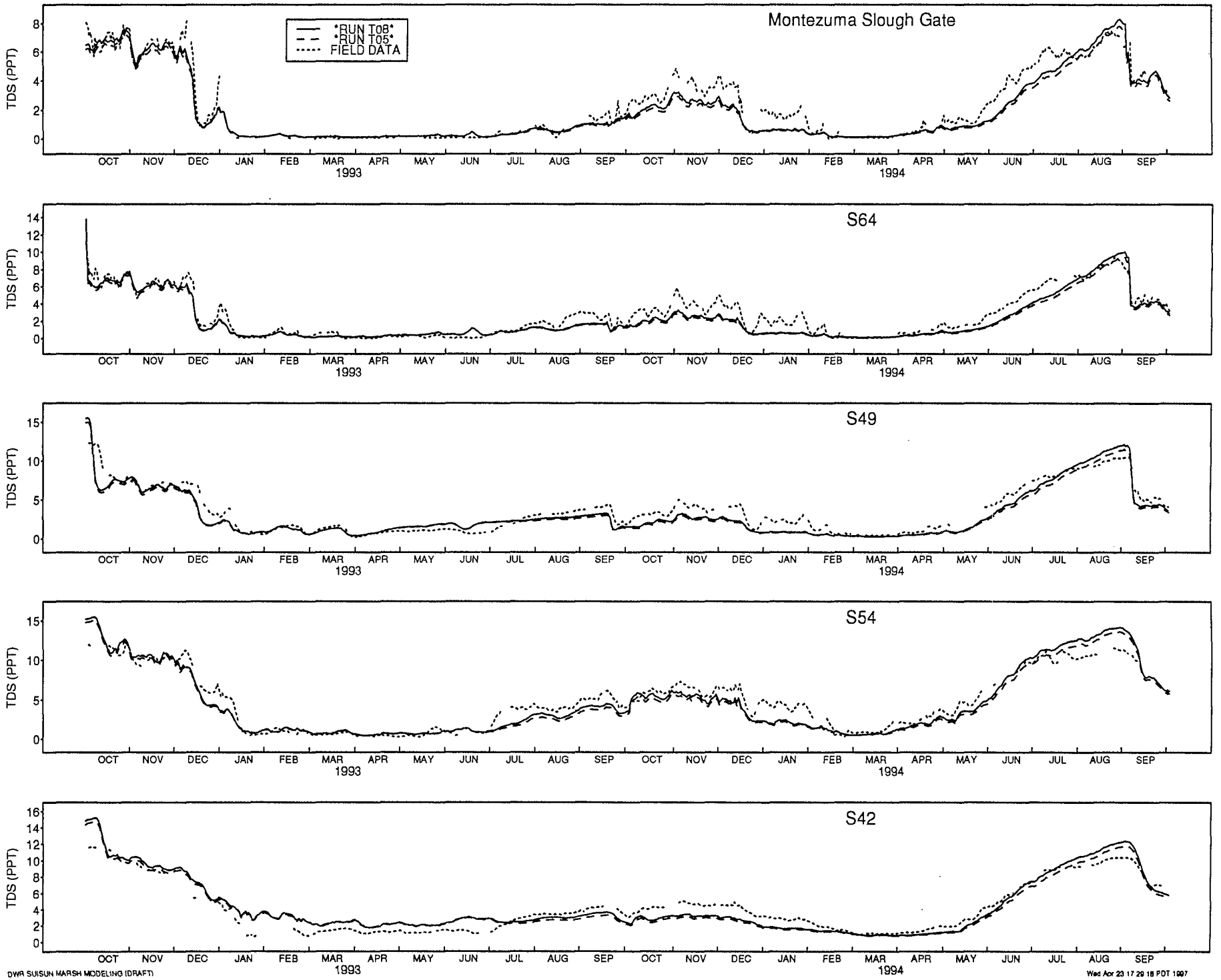




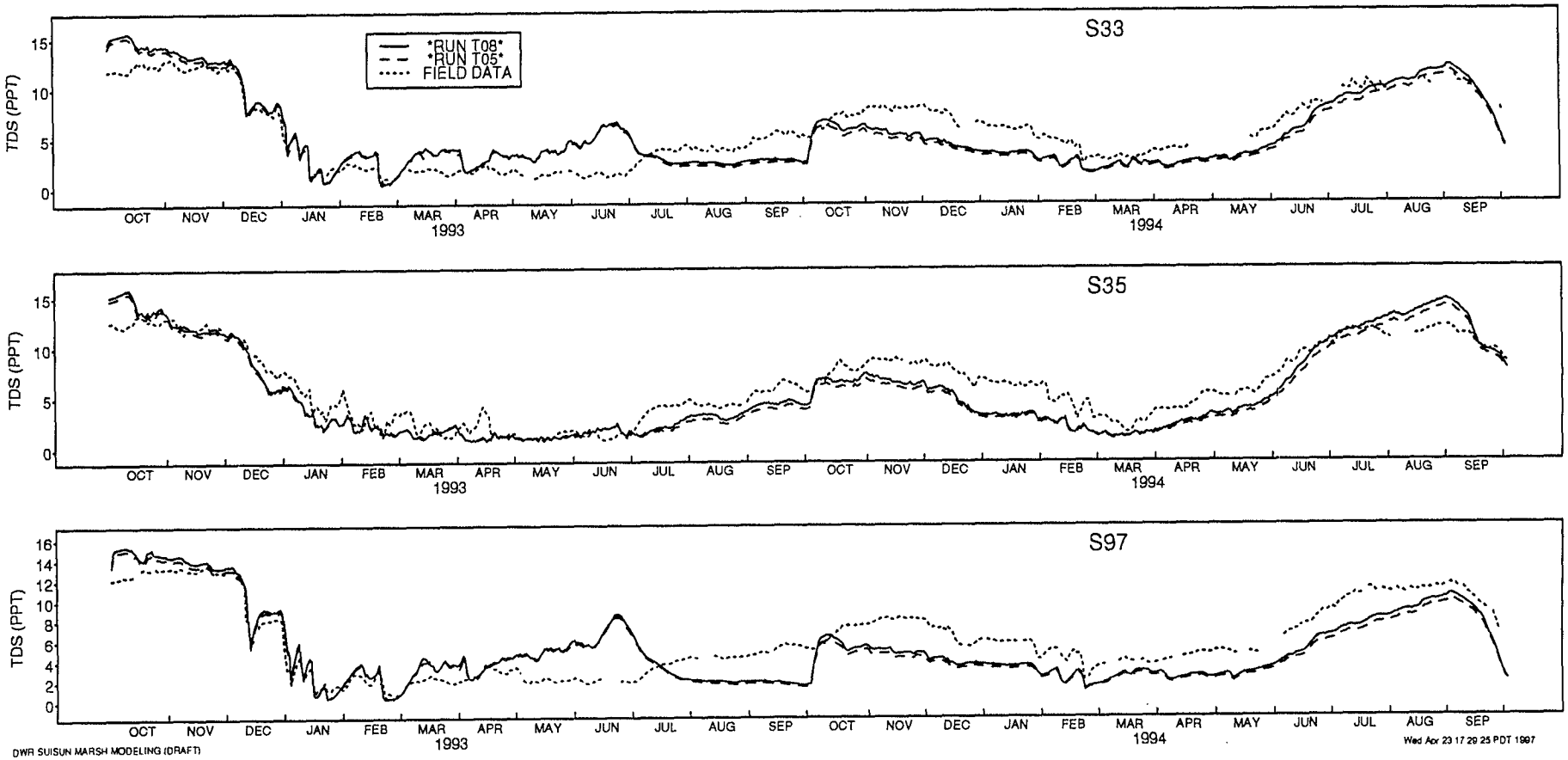


DSM1 Suisun Marsh Version Re-calibration - Tidal Day Average Salinity; WATER YEARS 1993 & 1994: *RUN T08* vs *RUN T05* Page 7





DSM1 Suisun Marsh Version Re-calibration - Tidal Day Average Salinity; WATER YEARS 1993 & 1994: *RUN T08* vs *RUN T05* Page 9



ERPP 10 Day Flow Event Targets - Delta/Major Tributaries

(CFS)

Sacramento-San Joaquin Delta Outflow		
March	20,000-40,000	(Dry thru. Above Normal Years)
April/May	20,000-40,000	(Dry thru. Above Normal Years)
Sacramento Upstream Flow		
March	5,000-20,000	(Dry thru. Above Normal Years)
Feather Upstream Flow		
March	4,000-10,000	(Dry thru. Above Normal Years)
Yuba Upstream Flow		
March	2,000-4,000	(Dry, Above Normal, Wet Years)
American Upstream Flow		
March/April/May	3,000-8,000	(Dry thru. Above Normal Years)
Stanislaus Upstream Flow		
April/May	2,500-4,000	(Below Normal thru. Wet Years)
Tuolumne Upstream Flow		
April/May	2,500-6,000	(Dry thru. Wet Years)
Merced Upstream Flow		
April/May	1,000-4,000	(Dry thru. Wet Years)

ERPP Monthly Flow Targets - Major Tributaries

(cfs)

Sacramento Flow (Freeport)		
May	13,000	(Dry thru. Wet Years)
Sacramento Upstream Flow		
Fall	6,000-8,000	(Critical thru. Wet Years)
American Upstream Flow		
Oct thru. Sept.	500-4,500	(Critical thru. Wet Normal Years)
Mokelumne Upstream Flow (Woodbridge)		
Oct thru. Sept.	100-450	(Dry thru. Wet Years)
Stanislaus Upstream Flow		
Oct. thru Sept.	200-800	(Critical thru. Wet Years)
April/May 31 Day Pulse	1500	(Critical thru. Wet Years)
Tuolumne Upstream Flow		
Oct. thru Sept.	50-3,000	(Dry thru. Wet Years)
Merced Upstream Flow (Shaffer Bridge)		
Oct. thru Sept.	15-100	(Dry thru. Wet Years)

D-006122